

IN THE SPECIFICATION:

Please replace paragraph [0001] with the following amended paragraph:

[0001] This application is a divisional of co-pending U.S. patent application Ser. No. 10/178,469, filed on Jun. 24, 2003, now US Patent No. 6,599,402, which claims the benefit of U.S. patent application Serial No. 09/294,240, filed on Apr. 19, 1999, now US Patent No. 6,416,647, which claims the benefit of U.S. Provisional Application Serial No. 60/082,494, filed on Apr. 21, 1998. Each of the aforementioned related patent applications are incorporated by reference herein.

Please replace paragraph [0039] with the following amended paragraph:

[0039] Figure 3 is a cross sectional schematic view of an electro-chemical deposition cell 200 showing a robot blade 88 transferring a substrate 202 into the electro-chemical deposition cell 200, and Figure 5 is a cross sectional schematic view of a substrate support member 204 in a transferring position according to the invention. By comparing Figures 3 2A and 5 3A, the sequence for loading and unloading a substrate may be seen. Referring initially to Figure 3, a robot blade 88 transfers a substrate 202 into the electro-chemical deposition cell 200 through the slit opening 280 and positions the substrate 202 above the substrate support member 204. At the substrate transferring position, the substrate support member 204 is retracted fully to a bottom portion of the electro-chemical deposition cell 200. Then, as shown in Figure 5, a plurality of lift pins 322 extend through vertical bores 324 in the substrate support member 204 and lift the substrate 202 above the robot blade 88. The robot blade 88 then retracts out of the chamber, and the slit valve 282 closes the slit opening 280.

Please replace paragraph [0043] with the following amended paragraph:

[0043] To provide a positive pressure between the substrate and the substrate support member 204, a gas pump 370 connected to a gas supply 372 is selectively

connected through a control valve 374 to the vacuum outlet 318 to supply a blow off gas to the vacuum ports 294. The blow off gas prevents leftover rinsing agent from contaminating the backside of the processed substrate when the substrate is lifted above the substrate support member 204 and transferred out of the electro-chemical deposition cell 200. The control valve 374 shuts the connection to the vacuum pump 360 when the gas pump 370 is activated to pump the blow-off gas to the vacuum ports 294, and the control valve 374 ~~274~~ shuts the connection to the gas supply 372 and the gas pump 370 when the vacuum pump 360 is activated to hold the substrate 202 on the support member 204. The vacuum ports 294 direct the blow off gas toward the backside edge of the substrate 202 to prevent any leftover rinsing agent from reaching the backside 215 of the substrate 202.

Please replace paragraph [0048] with the following amended paragraph:

[0048] To prevent electroplating solutions, rinsing solutions and other process chemicals from contacting components disposed in the central portion of the electro-chemical deposition cell 200, such as the lift platform actuator 326 and the shaft sleeve 308, a splash guard 333 is attached to an outer portion of a lower surface of the lift pin platform 320. The splash guard 333 includes a cylindrical downward extension 334 that is disposed radially outward of an upwardly extending inner container wall 336. The inner container wall 336 (shown in Figure 5) is a cylindrical upward extension from the enclosure bottom 106 of the electro-chemical deposition cell 200 that holds the process solutions to be pumped out of the system through the outlet 259 (shown in Figure 3). The splash guard 334 and the inner container wall 336 create a sufficient overlap so that when the lift pin platform 320 is raised to it highest position during processing, there is still an overlap between the tip of the splash guard 334 and the tip of the inner container wall 336 (as shown in Figure 4).

Please replace paragraph [0065] with the following amended paragraph:

[0065] Figure 12 shows one embodiment of the anode/cavity ring assembly for drip control where a substrate support member 204 is shown positioned in a rinsing position according to the invention. Preferably, the assembly of the cavity ring 236 and the anode plate 230 comprises two symmetrical halves split by a central vertical plane. An actuator 237_a is connected to each half to pull apart the anode/cavity ring assembly after the deposition phase of the process. Each half of the anode/cavity ring assembly is moved to the region above the electroplating solution catch cup 246 so that the residual electroplating solution drips into the electroplating solution catch cup.

Please replace paragraph [0066] with the following amended paragraph:

[0066] Figure 13 is a top view of a shutter plate 238 positioned above cathode clamp ring 210, showing an alternative solution for controlling the dripping of residual electroplating solutions from the anode/cavity ring assembly. A shutter plate 238 moves into the region between the anode/cavity ring assembly and the cathode clamp ring 210 to block the dripping residual electroplating solution from contaminating the processed substrate deposition surface. Preferably, the shutter plate 238 is attached to a rotary shutter actuator 239 and retracted into a shutter plate chamber 237_b during the deposition process. Once the deposition phase is completed, the rotary shutter actuator 239 rotates the shutter plate 238 below the anode/cavity ring assembly and blocks the dripping residual electroplating solution.

Please replace paragraph [0072] with the following amended paragraph:

[0072] In operation, a substrate 202 is transferred into the electro-chemical deposition cell 200 by a robot blade 88 through the slit opening 280 over a substrate support member 204 that is retracted fully. Figure 3 is a cross sectional schematic view of an electro-chemical deposition cell 200 showing a robot blade transferring a substrate 202 into the electro-chemical deposition cell 200. A slit valve 282 is opened during the substrate transfer, and a robot blade 88 having a substrate 202 thereon enters the electro-chemical deposition cell 200 through the slit opening 280. The substrate 202 is

positioned above the substrate support member 204, and the lift pin platform 320 is elevated. The substrate 202 is lifted above the robot blade 88 by the lift pins 322 272 on the lift pin platform 320 that is elevated by the lift platform actuator 326 extending the push rod 327. The robot blade 88 then retracts out of the electro-chemical deposition cell 200 and the slit valve 282 closes to seal the processing environment. Figure 5 3 is a cross sectional schematic view of the electro-chemical deposition cell 200 showing a substrate positioned over a substrate support member 204 and supported by lift pins 322 272. The lift platform actuator 326 retracts the push rod 327 to lower the lift pin platform 320 and position the substrate 202 onto the substrate supporting surface 206 and the outer seal O-ring 298. The vacuum chuck 290 engages the vacuum suction to hold the substrate 202 on the substrate supporting surface 206, and the outer seal (O-ring) 298 seals the backside of the substrate 202 from the processing chemicals.

Please replace paragraph [0078] with the following amended paragraph:

[0078] After the rinse process, the actuator 346 retracts fully and lowers the substrate support member 204 to the transfer position as shown in Figure 3. The vacuum chuck 290 disengages the vacuum suction and releases the substrate 202, and the lift platform actuator 326 extends the push rod 327 to elevate the lift pin platform 320 and the lift pins 322 272 to lift the processed substrate 202 above the substrate support surface 206. As the lift pins 322 272 lift the substrate 202 above the substrate support surface 206, a blow-off gas is pumped through the vacuum chuck 290 out of the vacuum port 294 to provide a gas flow directed at the backside edge of the substrate 202. The blow-off gas prevents any remaining rinse agent from contaminating the backside 215 of the substrate 202. The slit valve 282 opens, and the robot blade 88 extends into the electro-chemical deposition cell 200 through the slit 280. The robot blade 88 is positioned under the elevated substrate 202, and the lift pins 322 272 are lowered to position the substrate 202 onto the robot blade 88. The robot blade 88 then retracts out of the electro-chemical deposition cell 200 with the processed substrate, and the process repeats for the next unprocessed substrate.